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ONTARIO WATER RESOURCES COMMISSION

ANNUAL REPORT 1965

STRATFORD

water pollution control plant

DIVISION OF PLANT OPERATIONS
Ontario Water Resources Commission

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ONTARIO WATER RESOURCES COMMISSION

OFFICE OF THE GENERAL MANAGER

Members of the Stratford Local Advisory Committee,
City of Stratford.

Gentlemen:

I am pleased to provide you with the 1965 Annual Report for the Stratford Water Pollution Control Plant, OWRC Project No. 57-S-2.

We appreciate the co-operation you have extended to our Operations staff throughout the year, and trust that continuation of this close association will ensure even greater progress in the sphere of water pollution control.

Yours very truly,

D. S. Caverly,
General Manager.

ONTARIO WATER RESOURCES COMMISSION

801 BAY STREET

TORONTO 5

J. A. VANCE, LL.D.
CHAIRMAN

J. H. H. ROOT, M.P.P.
VICE-CHAIRMAN

D. S. CAVERLY
GENERAL MANAGER

W. S. MacDONNELL
COMMISSION SECRETARY

General Manager,
Ontario Water Resources Commission.

Dear Sir:

I am pleased to provide you with the 1965 Annual Report on the operation of the Stratford Water Pollution Control Plant, OWRC Project No. 57-S-2.

The report presents design data, outlines operating problems encountered during the year and summarizes in graphs, charts and tables all significant flow and cost data.

Yours very truly,

B. C. Palmer, P. Eng.,
Director,
Division of Plant Operations.

FOREWORD

This report provides useful information on the operating efficiency of this project during 1965. It is intended to act as a guide in gauging plant performance. To implement that aim, it includes detailed statistical and cost data, a description of the project and a summary of its operation during the year.

Of particular interest will be the cost data, which show the total cost to the municipality and the areas of major expenditure.

The Regional Operations Engineer is primarily responsible for the preparation of the report, and has compiled and arranged the material. He will be pleased to answer any questions regarding it. Other groups, however, were involved in the production, and these include the statistics section, the Drafting Section of the Division of Sanitary Engineering and the Division of Finance.

B. C. Palmer, P. Eng.,
Director,
Division of Plant Operations.

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STRATFORD
water pollution control plant

operated for

THE CITY OF STRATFORD

by the

ONTARIO WATER RESOURCES COMMISSION

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VICE-CHAIRMAN: J. H. H. Root, M.P.P.

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F. A. Voege — A. K. Watt

COMMISSION SECRETARY

W. S. MacDonnell

DIVISION OF PLANT OPERATIONS

DIRECTOR: B. C. Palmer

Assistant Director: C. W. Perry
Regional Supervisor: A. C. Beattie
Operations Engineer: P. J. Osmond

801 Bay Street Toronto 5

'65 REVIEW

The following report gives in detail significant data on the operation of the various treatment units at the Stratford Water Pollution Control Plant.

With an average daily flow of 3.13 million gallons, the plant is operating at approximately 78% of its full treatment capacity of 4.0 million gallons per day. Future sanitary sewer extensions will gradually increase the flow to the design value.

Plans are presently being made to construct facilities for chlorination of the final effluent. The addition of chlorine to the final effluent, to produce a residual of 0.5 ppm, is sufficient to kill most of the pathogenic bacteria. Chlorination equipment can be expected to increase the operating costs of the plant.

The 1965 operating costs increased about 6.5% over 1964. The treatment cost of $49.96 per million gallons has decreased from the 1964 value of $53.94. Both are considered economical.

Under the constant supervision of head office engineers, the plant staff has maintained a clean, attractive and efficient plant for the City of Stratford. A special emphasis is placed on public relations and aesthetic qualities of the plant. Each year many tourists and groups tour the facilities.

GLOSSARY

BOD	biochemical oxygen demand (a measure of organic content)
cfm	cubic feet per minute
comminution	shredding of solids into small fragments
DWF	dry weather flow
effluent	outflow
flocculation	bringing very small particles together to form a larger mass (the floc) before settling
fps	feet per second
gpcd	gallons per capita per day
gpm	gallons per minute
grit	sand, dust, stones, cinders and other heavy inorganic material
influent	inflow
lin. ft.	lineal feet
mgd	million gallons per day
mlss	mixed liquor suspended solids
ppm	parts per million
ss	suspended solids
TDH	total dynamic head (usually refers to pressure on a pump when it is in operation)

HISTORY
1957 - 1965

INCEPTION

In 1957, the City of Stratford and the Ontario Water Resources Commission initiated plans to extend the then existing activated sludge treatment plant, which had been in operation since 1930.

The firm of Canadian-British Engineering Consultants were engaged to prepare plans and specifications for the project.

On July 5, 1957, the city signed an agreement with the Ontario Water Resources Commission to finance, construct and operate the plant.

CONSTRUCTION

Schwenger Construction Company Limited of Hamilton began construction in 1957 and, in June of 1958, the Division of Plant Operations commenced operation of the new plant.

TOTAL COST

The cost of this plant extension was $935,309.42.

C. W. BIGGIN
CHIEF OPERATOR

Project Staff

Assistant Chief Operator

J. E. Gotts

Operators

J. Craig
W. McManus
R. Tuer
W. R. Marriott

COMMENTS

Casual labour is utilized particularly during the summer months to provide relief during vacations, sick leave and heavy work load periods. The plant is staffed 12 hours per day during the week and 8 hours per day on both Saturday and Sunday.

Mr. Craig completed the basic and intermediate sewage works operators' courses in 1965 which are sponsored by the OWRC. Messrs. Biggin and Gotts both received a maintenance gas fitters certificate in 1965. A course in First Aid was attended by Messrs. Biggin, Gotts and Mc Manus and Mr. Biggin completed a course entitled "Techniques of Supervision" sponsored by the University of Waterloo.

Description of Project

INFLUENT WORKS

An inlet channel, fitted with a storm overflow weir for flows in excess of 16 MGD, conducts the sewage from two large concrete sewers to the screening chamber. The screening chamber is divided into two parallel channels, one of which contains a "barminutor" which cuts and shreds the solid materials in the sewage. The second channel is fitted with a manually cleaned bar screen used only when it is necessary to by-pass the barminutor.

INFLUENT WORKS

Flow continues by gravity to a shallow settling tank where grit settles out and is removed by a Dorr detritor mechanism. A grit washing mechanism and organic return pump completes the influent works. The cleared grit is discharged to a barrow and subsequently disposed of by burial on the plant grounds.

PRIMARY CLARIFIERS

Four circular concrete clarifiers, each 80' in diameter, receive flow from the influent works. Primary sedimentation of flows up to 8 MGD is accomplished using two tanks and the other two are kept empty to handle storm flows up to 16 MGD. In either instance, the minimum detention is two hours.

Circular sludge collector and scum collector mechanisms move the settled and the floating primary sludge to sludge hoppers. This primary sludge

is then pumped to the digestion tank via sludge pumps located in the machinery building.

The primary clarifier effluent flows over a peripheral weir and is directed to a main sewage pump well under the machinery house.

AERATION

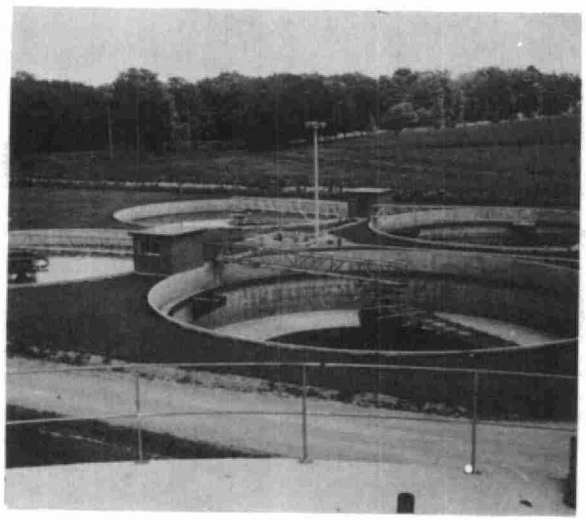
Main sewage pumps lift a maximum of 8 MGD from the pump well to five triple pass aeration tanks where it is mixed with activated sludge returned from the final settling tanks. In the aeration tanks air is introduced into the mixed liquor through. 7" diameter steel dome diffusers.

The air is supplied by three compressors, each with a capacity of 1750 cubic feet per minute at 7 psi.

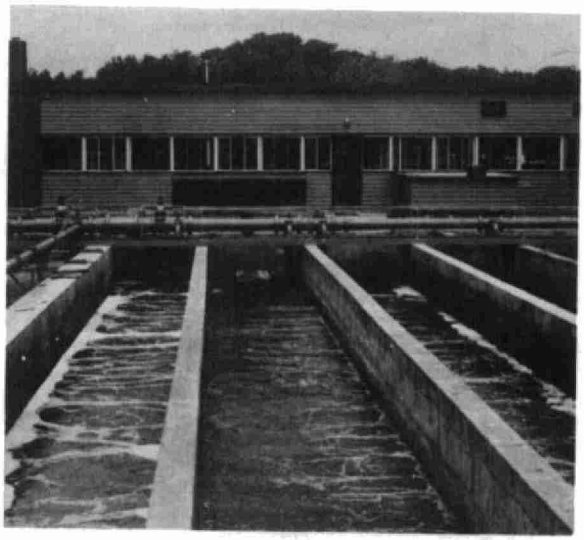
The aeration section provides five hours detention on a 4 MGD flow.

FINAL CLARIFIERS

Two 80 foot diameter concrete final clarifiers detain the flow from the aeration tanks, allowing the activated sludge to settle out. Some of this activated sludge is returned to the head of the aeration tanks to supply the bacteria needed for aerobic digestion of the solids loading from the primary tanks. The remaining activated sludge is "wasted" to the primary clarifiers where it settles



PRIMARY CLARIFIERS



AERATION TANKS

and joins the raw sludge going to the digestion tank.

The clear liquid overflows a peripheral weir and is conducted to the river as final effluent.

SLUDGE DIGESTION TANK

Sludge from the primary clarifier composed of raw sludge, scum and waste activated sludge is pumped to a circular two stage digester. The digester is 73 feet in diameter, 26 feet deep, and has a capacity of 100,000 cubic feet.

A cylindrical partition wall divides the digester into two compartments. Active digestion, incorporating recirculated gas mixing and heating coils to maintain a temperature of about 95° F. takes place in the inner tank which has a capacity of 67,600 cubic feet. The annular outside compartment forms a quiescent zone where gradual settling occurs. Supernatant liquid which has a very low percentage of solids is gravitated to the primary clarifiers.

Thickened digested sludge is piped from the digester to a sludge storage tank and is transported under contract to farm land where it is used as a soil conditioner.

The digestion process requires about one month. Methane gas, formed during digestion, is stored under the digester roof and used as fuel for heating the plant.

PROJECT COSTS

NET CAPITAL COST (Final)	$925,309.42
DEDUCT - Payments from Municipality	309.42
Long Term Debt to OWRC	$925,000.00
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1965	$157,208.28
Net Operating	57,079.98
Debt Retirement	18,667.00
Reserve	5,375.29
Interest Charged	51,898.97
TOTAL	$133,021.24

RESERVE ACCOUNT

Balance at January 1, 1965	$ 51,658.49
Deposited by Municipality	5,375.29
Interest Earned	2,973.66
	$ 60,007.44
Less Expenditures	-
Balance at December 31, 1965	$ 60,007.44

MONTHLY OPERATING COSTS

MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICAL	GENERAL SUPPLIES	EQUIPMENT	REPAIRS & MAINTENANCE	* SUNDRY	WATER
JAN	2775.25	2162.53	231.00	135.90			183.10		46.79	15.93	
FEB	4685.38	2164.77	237.12		426.33		213.08		775.40	816.60	52.08
MARCH	4536.15	2386.87	243.12		515.16	49.28	599.49		103.92	586.23	52.08
APRIL N	4185.23	2376.57	93.15		471.15		146.86		19.14	1026.28	52.08
MAY	4883.70	3294.57			512.28		301.15		252.49	471.13	52.08
JUNE	4371.55	2205.23		31.20	492.84		131.74	19.98	419.97	1018.51	52.08
JULY	4529.74	2400.05			460.80		307.81	70.76	113.31	1124.93	52.08
AUG	5659.20	2338.88		30.15	477.72		263.27	7.11	322.80	2167.19	52.08
SEPT	4093.43	2338.88			535.32		307.10	16.90	208.72	634.43	52.08
OCT	5645.74	3521.67			445.68		394.77	216.40	64.36	950.78	52.08
NOV	4303.33	2493.80		88.21		141.86	289.17	149.53		1088.68	52.08
DEC	7411.28	2411.39			969.33	49.93	585.25	159.81	651.42	2479.99	104.16
TOTAL	57079.98	30095.21	804.39	285.46	5306.61	241.07	3722.79	640.49	2978.32	12380.68	624.96

* SUNDRY INCLUDES SLUDGE HAULING COSTS WHICH WERE $9,394.70

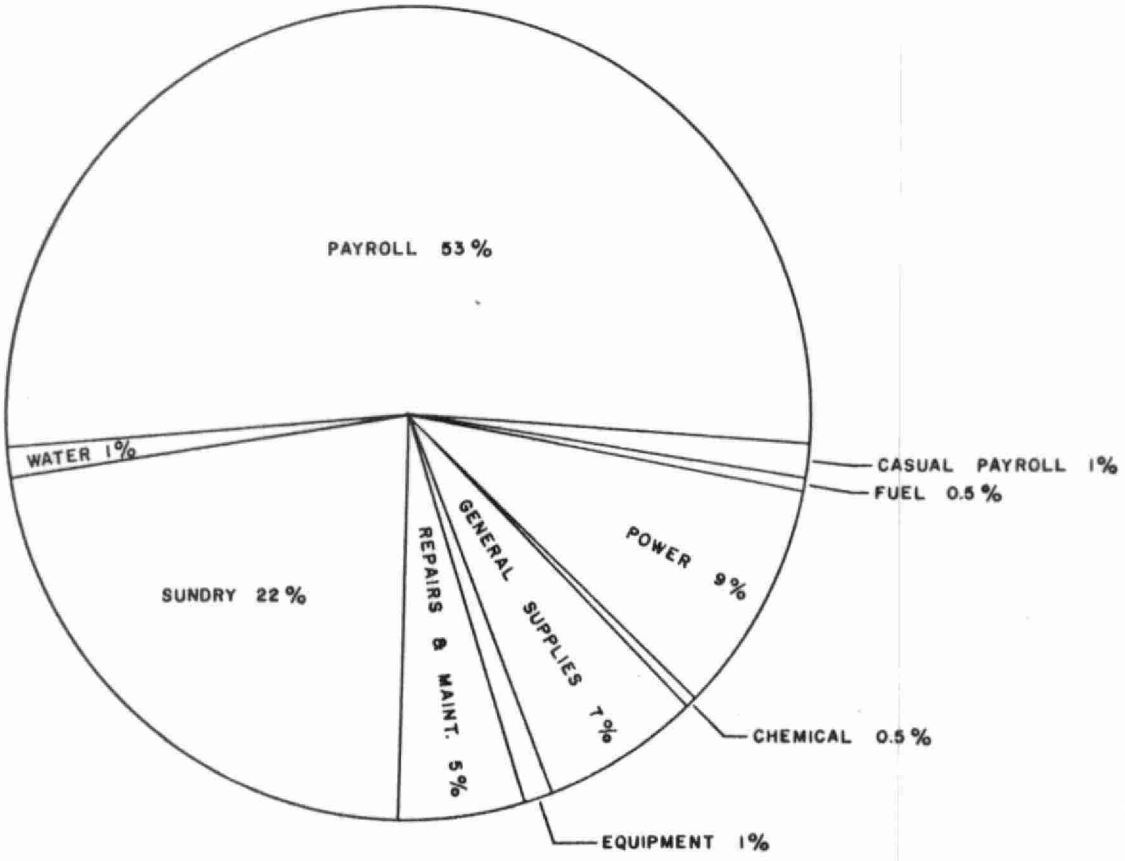
BRACKETS INDICATE CREDIT

YEARLY OPERATING COSTS

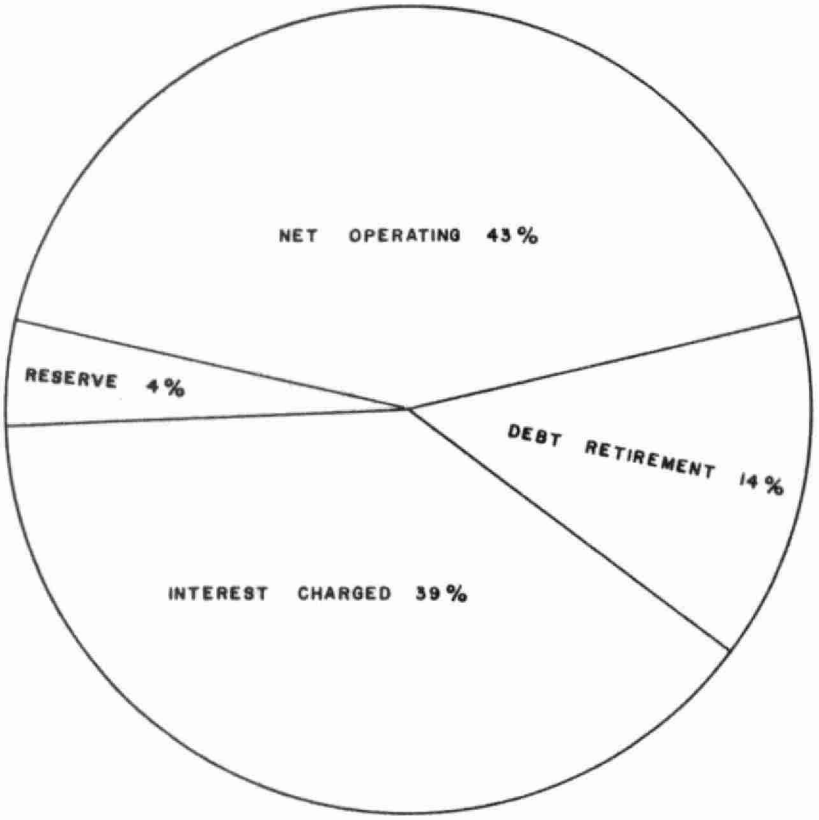
YEAR	M.G. TREATED	TOTAL COST	COST PER FAMILY PER YEAR	COST PER MILLION GALLONS	COST PER L.B. OF BOD REMOVED
1961	933.41	$ 55015.86	* $ 10.30	$ 58.94	2 CENTS
1962	765.39	48157.96	9.01	62.92	3 CENTS
1963	774.22	52799.80	9.87	68.15	3 CENTS
1964	994.33	53649.88	9.59	53.95	3 CENTS
1965	1142.53	57079.98	10.22	49.96	3 CENTS

* BASED ON ESTIMATED ANNUAL POPULATION AND 3.9 PERSONS PER FAMILY

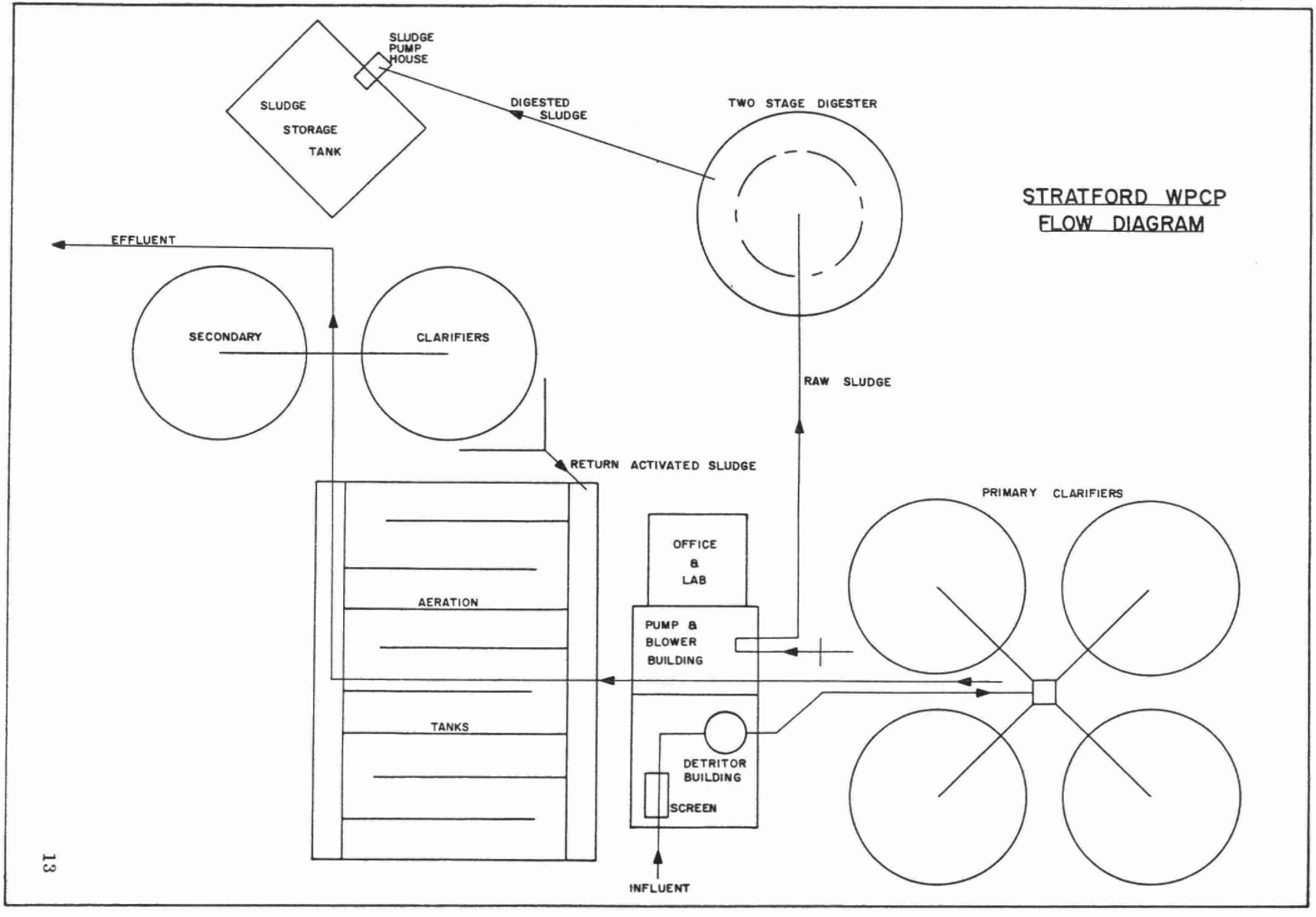
1965 OPERATING COSTS



TOTAL ANNUAL COST



Technical Section


SLUDGE PUMP HOUSE
SLUDGE STORAGE TANK
DIGESTED SLUDGE
TWO STAGE DIGESTER
STRATFORD WPCP
FLOW DIAGRAM
EFFLUENT
SECONDARY
CLARIFIERS
RAW SLUDGE
RETURN ACTIVATED SLUDGE
PRIMARY CLARIFIERS
OFFICE & LAB
AERATION
PUMP & BLOWER BUILDING
TANKS
DETRITOR BUILDING
SCREEN
INFLUENT

Design-Data

GENERAL

Type of Plant - Activated Sludge

- Diffused air aeration.

Design Population - 30,000 persons

Design Plant Flow

- 4 mgd at D. W. F.
- Max. instantaneous rate (primary) 16 mgd.
- Max. instantaneous rate (secondary) 9 mgd.
- Max. storm flow storage - 8 mgd.

Per Capita Flow - 130 gallons per capita per day.

Five Day BOD

Raw Sewage - 140 ppm

Removal - 90%

Suspended Solids

Raw Sewage - 250 ppm

Removal - 95%

PRIMARY TREATMENT

Screening

36 inch Barminutor-Chicago Model "C"
12 mgd capacity
Barminutor bypass screen.

Grit Removal

Dorr detritor
20' x 20' tank
1.4 min. detention at D. W. F.

PRIMARY CLARIFIERS

Number of Tanks - 4, 2 for all flows to 8 mgd.
- 2 for storm flows over 8 mgd.

Size - 80' diameter and 10.5 feet deep.

Type - concrete circular tanks, Infilco Model BF mechanisms.

Volume - 330,000 gallons per tank for a total of 1,320,000 gallons.

Weir Overflow Rate - 8,000 gallons per lineal foot per day at D. W. F. (using 2 clarifiers).

Surface Settling Rate - 400 gallons per sq. ft. per day at D. W. F. (using 2 clarifiers).

Retention - 4 hours at 4 MGD (using 2 clarifiers).

SECONDARY TREATMENT

Number of Tanks - 5

Volume - total of 970,000 gallons

Retention - 5. 8 hours at 4 mgd

Return sludge volume - 20%

Air supply - 1. 22 cubic feet per gallon

Compressors - Rotary type - 1750 cfm at 7 psi.

FINAL SETTLING TANKS

Type - circular concrete tanks - Infilco model BD mechanism

Number of Tanks - 2

Size - 80 ft. diameter x 11' - 3" deep

Volume - 705,000 gallons total

Retention - 4 hours at 4 mgd

Surface Settling Rate - 400 gallons per sq. ft. per day at 4 mgd.

Weir Overflow Rate - 8,000 gallons per lineal ft. of weir per day at 4 mgd.

DIGESTION SYSTEM

Type - heated two stage digester

Size - 73' diameter x 26' depth

Total volume - 100,000 cubic ft.

Primary Stage - 67,600 cubic ft.
- 2. 25 cubic ft. per capita
- 1. 85 lbs. solids per cubic ft. per month.

Secondary Stage - 32,400 cubic ft. ring around primary stage.

Sludge disposal - liquid haulage by contractor.

EFFLUENT

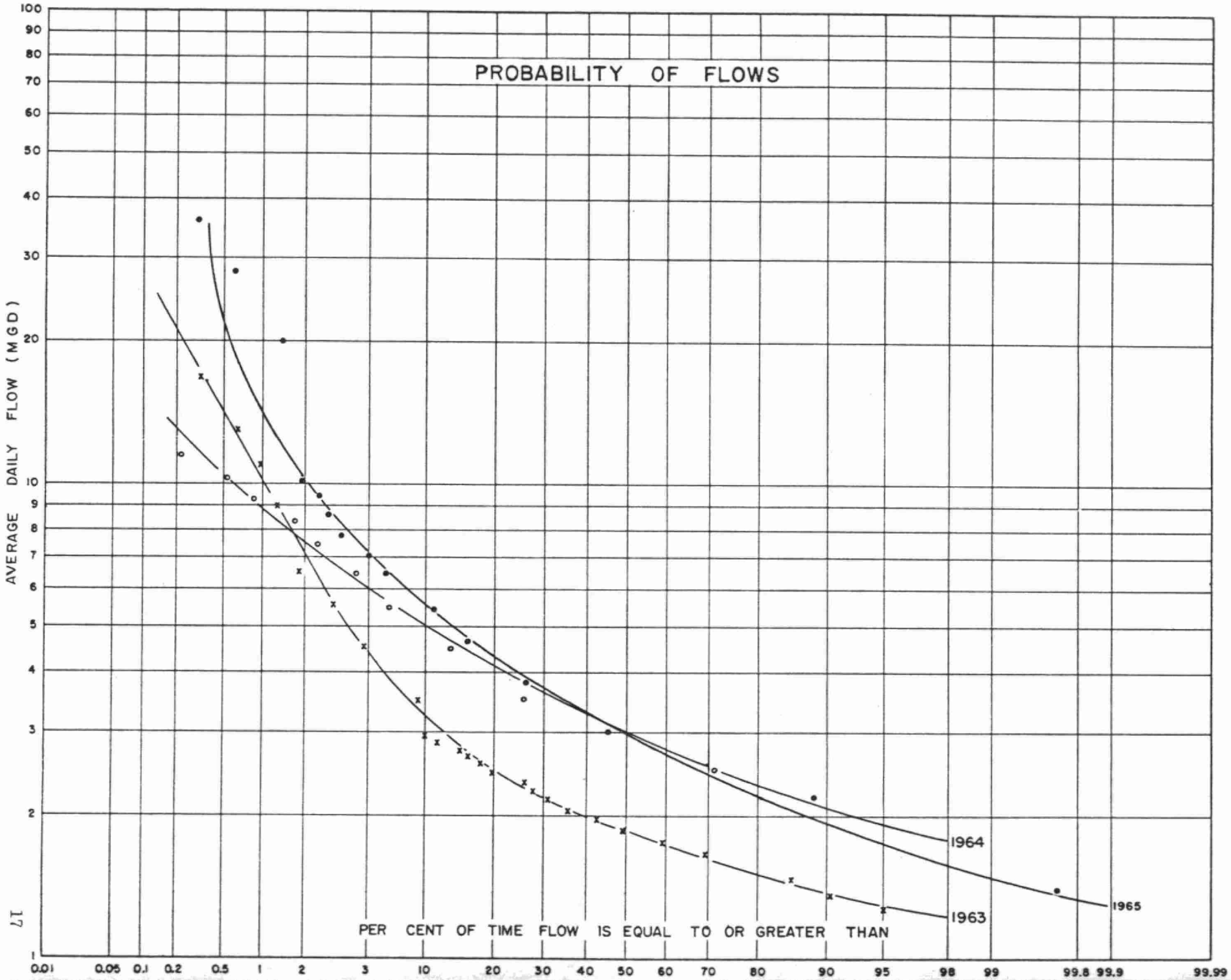
Discharged to Avon River.

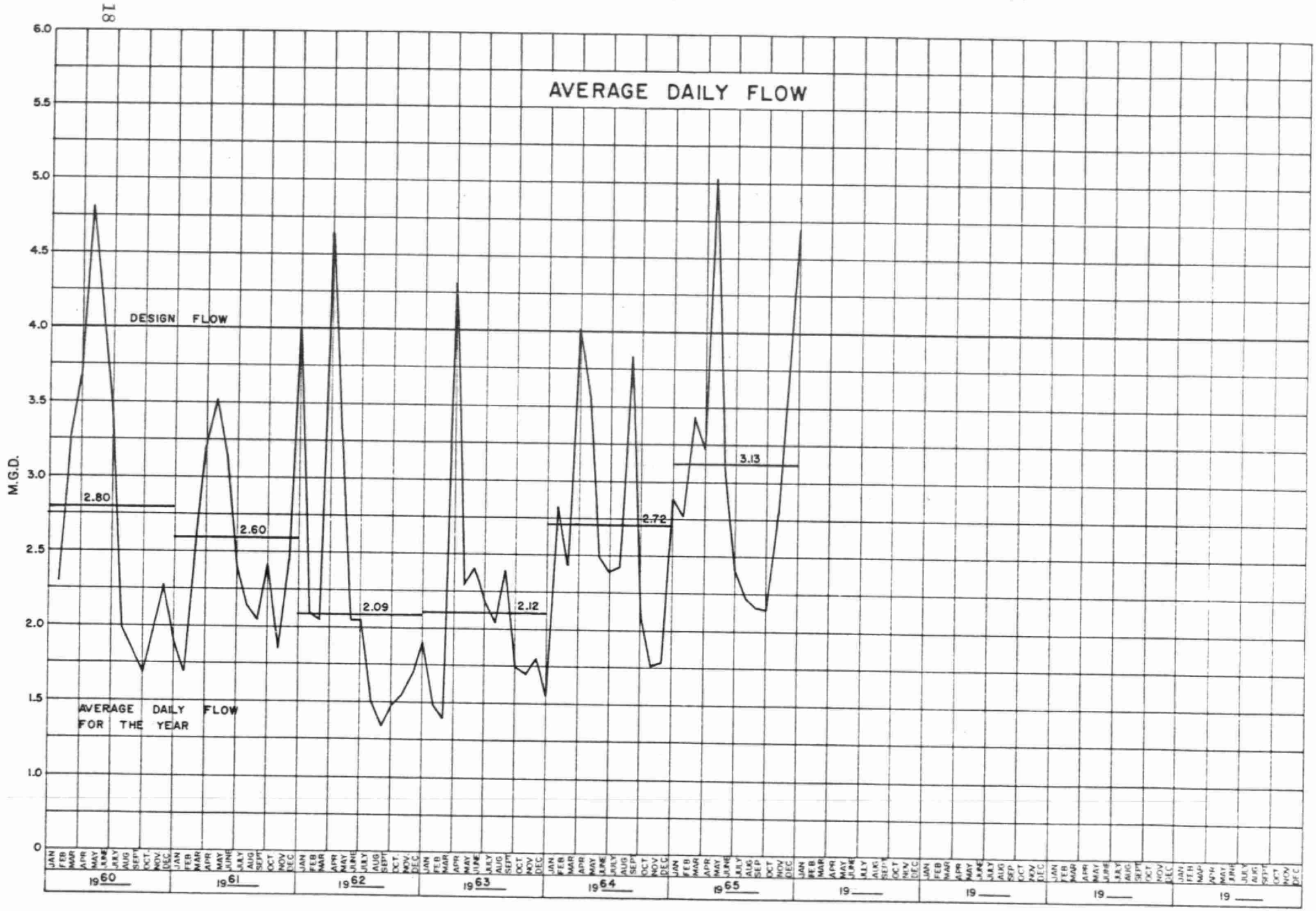
Process Data

The average daily flow and total flow for the year were greatly increased over the 1964 flows. During 1965, the average daily flow was 3. 13 million gallons, an increase of 15% over the average of 2. 72 million gallons per day received during 1964; 1142. 53 million gallons of raw sewage composed of both industrial and domestic wastes received complete treatment.

The maximum 24 hour flow in the past year was 12. 37 million gallons and occurred in the month of December. The maximum rate of flow recorded was 17 MGD. The versatility in design of this plant enables flow rates up to 8 million gallons per day to receive complete treatment for short periods. In addition, two of the primary tanks are used as storm units and can be used to store flash flood waters for treatment when the flow subsides. Primary treatment can be given to flow rates up to 16 million gallons per day. For these reasons, it is only on very rare occasions that any part of the flow must be bypassed.

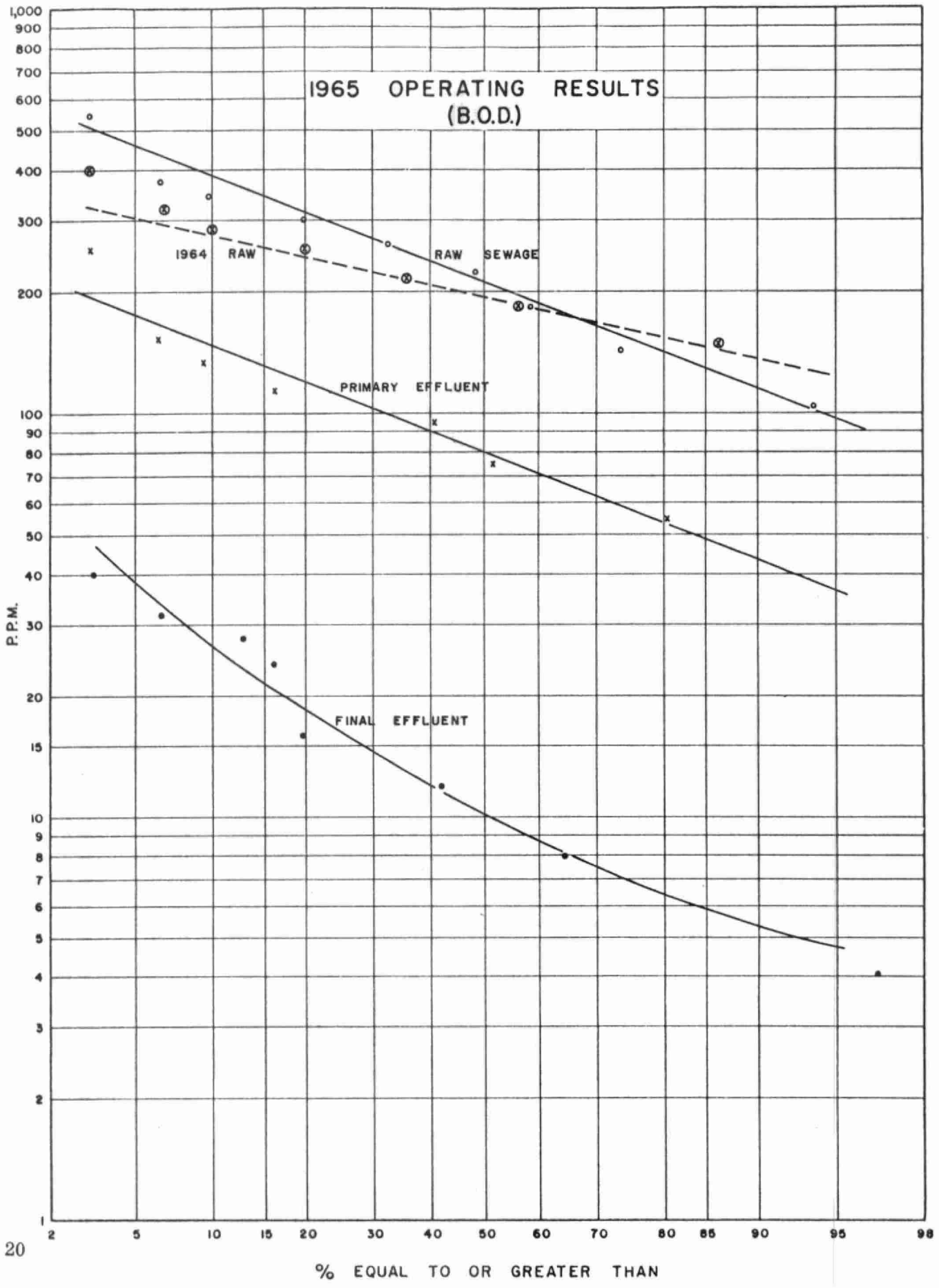
The probability curves are compound, the steeper sloped portion representing storm flows and the lesser sloped portion representing normal dry weather flows.


PROBABILITY OF FLOWS
AVERAGE DAILY FLOW (MGD)
100
90
80
70
60
50
40
30
20
10
9
8
7
6
5
4
3
2
1
0.01
0.05
0.1
0.2
0.5
1
2
3
10
20
30
40
50
60
70
80
90
95
98
99
99.8
99.9
99.99
PER CENT OF TIME FLOW IS EQUAL TO OR GREATER THAN
1964
1965
1963


AVERAGE DAILY FLOW
M.G.D.
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0
DESIGN FLOW
2.80
2.60
2.09
2.12
2.72
3.13
AVERAGE DAILY FLOW FOR THE YEAR
1960
1961
1962
1963
1964
1965
19__

FLOW DATA

Month	Plant Flow (MG)	Avg. Daily Flow (MG)	Min. Day (MG)	Max. Day (MG)
JANUARY	85.92	2.77	0.85	8.02
FEBRUARY	96.17	3.40	1.84	11.77
MARCH	100.53	3.24	2.02	11.00
APRIL	150.79	5.02	2.09	10.02
MAY	95.83	3.09	1.24	11.32
JUNE	72.50	2.42	1.05	4.68
JULY	69.43	2.24	1.31	3.31
AUGUST	67.38	2.17	1.34	3.98
SEPTEMBER	64.56	2.16	1.55	3.70
OCTOBER	85.57	2.76	1.21	7.09
NOVEMBER	108.55	3.62	1.85	9.08
DECEMBER	145.30	4.69	1.99	12.37
TOTAL	1142.53	-	-	-
AVERAGE	95.21	3.13	-	-


1965 OPERATING RESULTS
(B.O.D.)
1964 RAW
RAW SEWAGE
PRIMARY EFFLUENT
FINAL EFFLUENT
P.P.M.
% EQUAL TO OR GREATER THAN
1,000
900
800
700
600
500
400
300
200
100
90
80
70
60
50
40
30
20
15
10
9
8
7
6
5
4
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10
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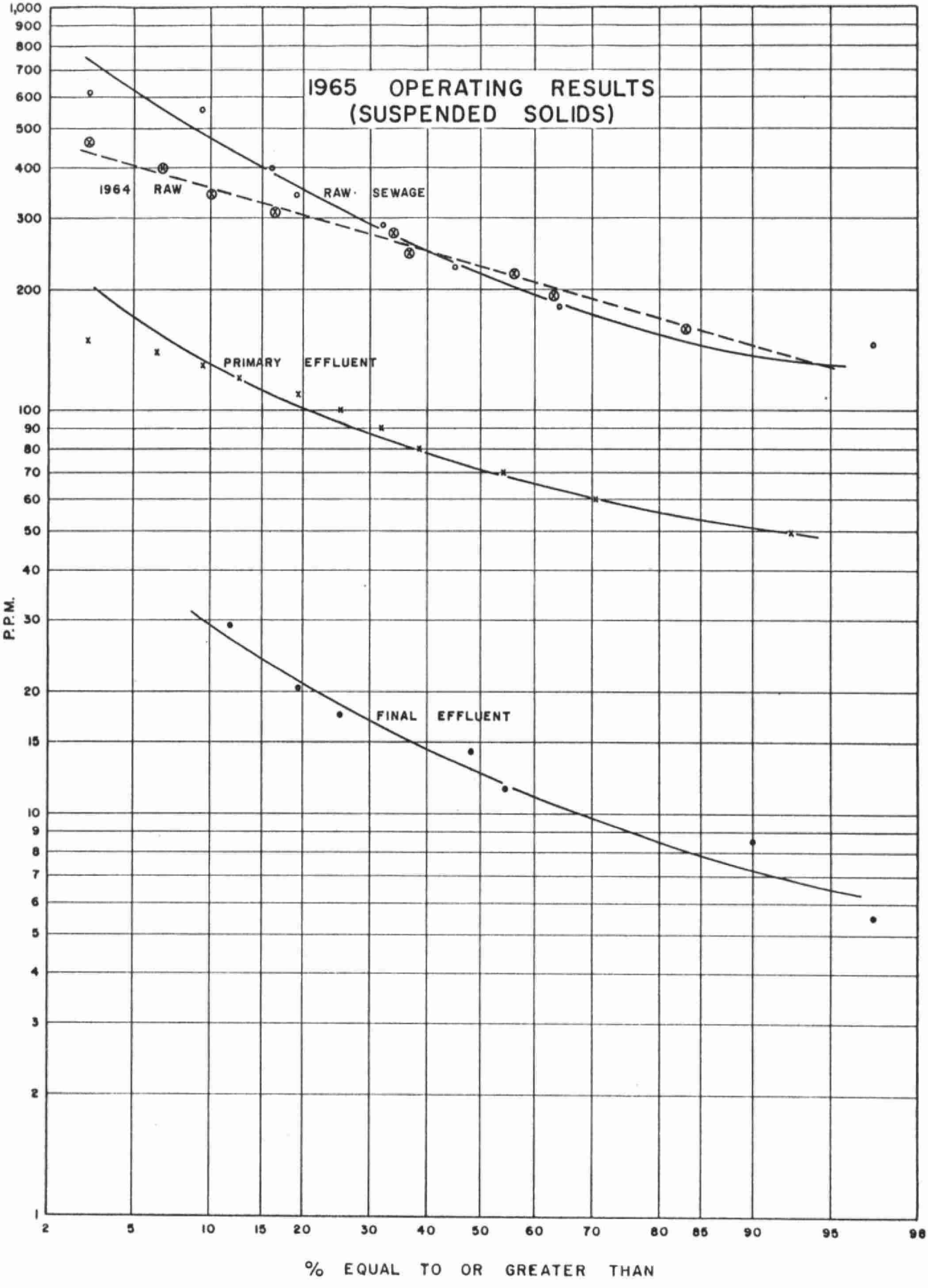
20
30
40
50
60
70
80
85
90
95
98


1965 OPERATING RESULTS
(SUSPENDED SOLIDS)
1964 RAW
RAW SEWAGE
PRIMARY EFFLUENT
FINAL EFFLUENT
P.P.M.
1,000
900
800
700
600
500
400
300
200
100
90
80
70
60
50
40
30
20
15
10
9
8
7
6
5
4
3
2
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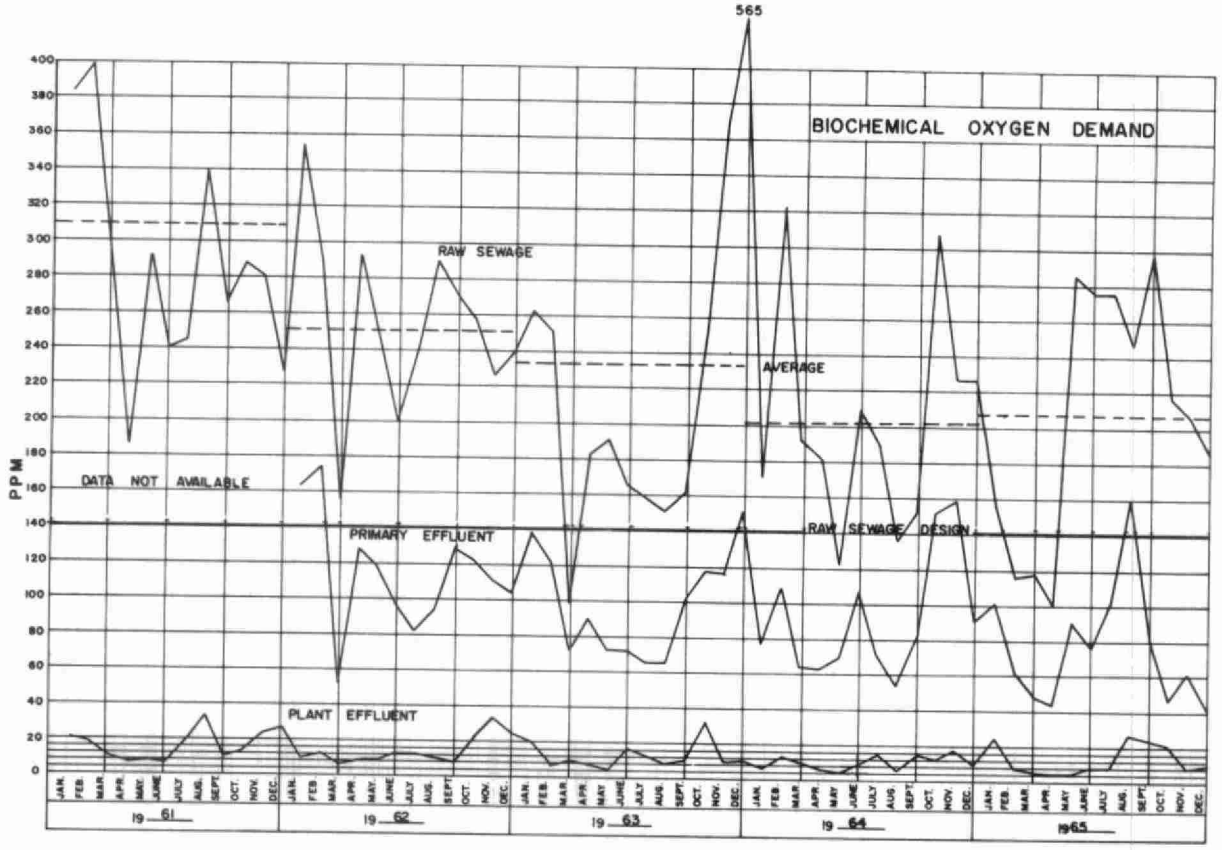
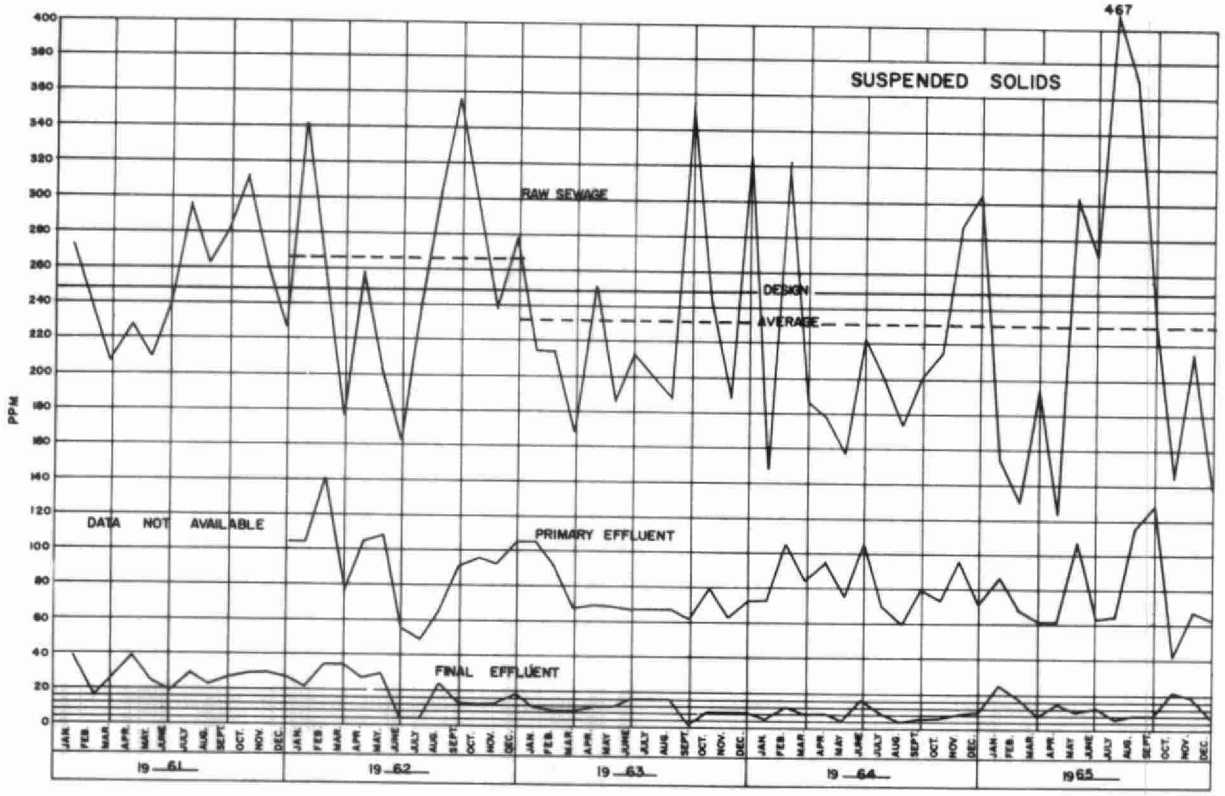
95
98
% EQUAL TO OR GREATER THAN



MONTHLY VARIATIONS



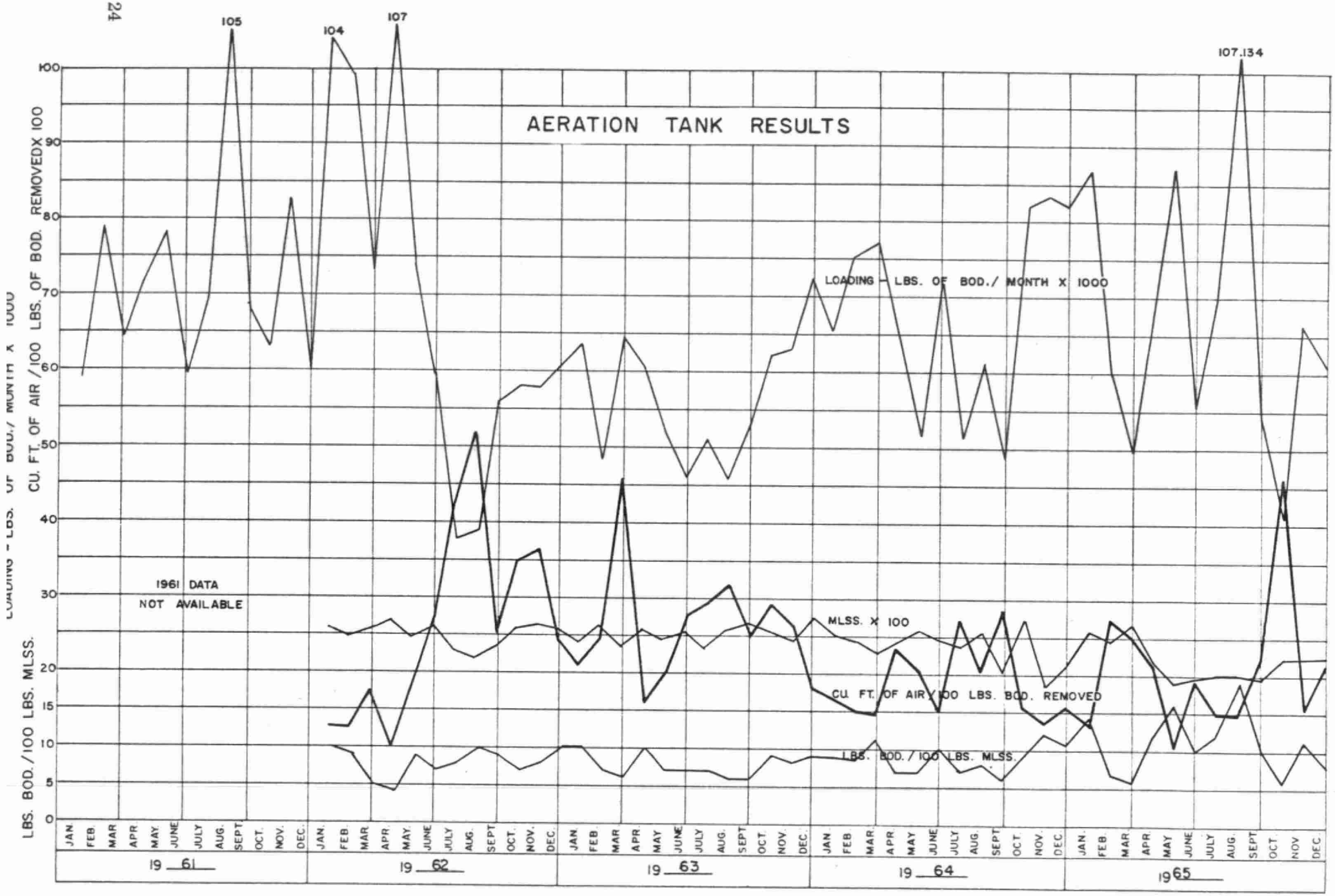
GRIT, B.O.D AND S.S. REMOVAL

MONTH	B. O. D.				S. S.				GRIT REMOVAL CU. FT.
	INFLUENT P.P.M.	EFFLUENT P.P.M.	% REDUCTION	TONS REMOVED	INFLUENT P.P.M.	EFFLUENT P.P.M.	% REDUCTION	TONS REMOVED	
JAN.	156	24	84.5	57.2	154	25	84.0	55.4	71
FEB.	117	8	93.0	52.4	130	18	86.0	53.8	184
MAR.	118	6.2	95.0	56.2	194	7.7	96.0	93.6	72
APR.	100	5.1	95.0	71.6	124	14	88.5	82.9	92
MAY	286	5	98.0	134.6	304	10	96.5	140.9	158
JUNE	272	9	96.5	95.3	271	12	95.5	93.9	68
JULY	275	8	97.0	92.7	467	6	98.5	160.0	177
AUG.	245	23	90.5	74.8	371	4	99.0	123.6	136
SEPT.	302	22	92.5	90.4	237	4	98.5	75.2	221
OCT.	218	21	90.5	84.3	145	20	86.0	53.5	115
NOV.	207	9	95.5	107.5	215	18	91.5	107.0	100
DEC.	187	9	95.0	129.3	148	8	94.5	101.7	313
TOTAL	–	–	–	1114.0	–	–	–	1245.4	1707
AVG.	207	12	94.0	93.0	230	12	94.5	103.8	142

COMMENTS

The average BOD loading at this plant of 207 ppm is still above the design value of 140 ppm. The average suspended solids concentration of 230 ppm is slightly less than the design value of 250 ppm. The average values of the effluent quality are better than the Commission objectives of 15 ppm for both BOD and suspended solids.

Chlorination of the final effluent is not presently practiced at the plant. Surveys of the receiving stream have indicated the necessity of providing chlorination facilities to maintain a coliform count of less than 2400 units per 100 ml in the stream.

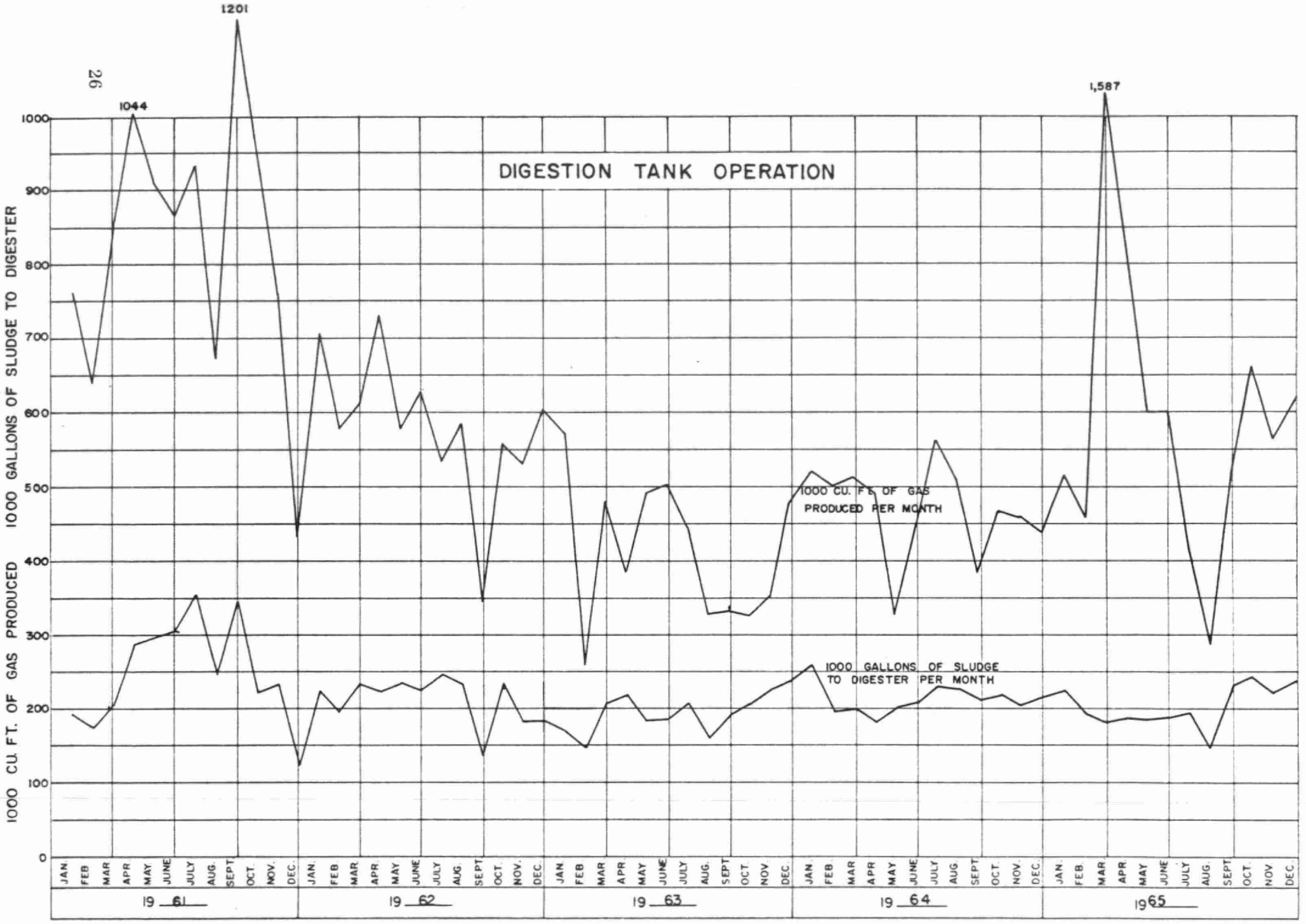

AERATION TANK RESULTS
105
104
107
107.134
LOADING - LBS. OF BOD./ MONTH X 1000
MLSS. X 100
CU. FT. OF AIR / 100 LBS. BOD. REMOVED
LBS. BOD. / 100 LBS. MLSS.
1961 DATA
NOT AVAILABLE
LOADING - LBS. OF BOD./ MONTH X 1000
CU. FT. OF AIR /100 LBS. OF BOD. REMOVEDX 100
LBS. BOD./100 LBS. MLSS.
0
5
10
15
20
30
40
50
60
70
80
90
100
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT OCT. NOV. DEC.
19 61
19 62
19 63
19 64
1965

AERATION SECTION

MONTH	PRIM. EFFL. B.O.D. P.P.M.	M.L.S.S. P.P.M.	LBS. B.O.D. PER 100 LBS. M. L. S. S.	CUBIC FEET AIR PER LB. B.O.D. REMOVED
JANUARY	101	2598	14	1344
FEBRUARY	62	2465	7	2706
MARCH	49	2681	6	2501
APRIL	45	2199	12	2179
MAY	91	1910	16	1084
JUNE	77	1995	10	1904
JULY	101	2006	12	1500
AUGUST	159	2003	19	987
SEPTEMBER	84	1987	10	2327
OCTOBER	48	2248	6	4614
NOVEMBER	61	2308	11	1577
DECEMBER	42	2418	9	2088
TOTAL				
AVERAGE				

COMMENTS

The aeration loadings indicate an average BOD reduction in the primary clarifiers of 63%. The aeration loading of 11 pounds BOD per 100 pounds MLSS is considerably less than the 20 to 40 lbs. usually recommended. The MLSS have been kept at a relatively high value to counteract the foam problem. The use of fuel oil has been successful in controlling the remaining foam. The effluent quality does not appear to be impaired by the high MLSS as experiments carried out in 1965 indicated. In fact increasing the pounds of BOD per 100 lbs. of MLSS had an adverse affect on the plant.


DIGESTION TANK OPERATION
1000 CU. FT. OF GAS PRODUCED PER MONTH
1000 GALLONS OF SLUDGE TO DIGESTER PER MONTH
1000 CU. FT. OF GAS PRODUCED 1000 GALLONS OF SLUDGE TO DIGESTER
1044
1201
1,587
0
100
200
300
400
500
600
700
800
900
1000
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT OCT. NOV. DEC.
19 61
19 62
19 63
19 64
1965

DIGESTER OPERATION

MONTH	SLUDGE TO DIGESTERS			SLUDGE FROM DIGESTERS			GAS PRODUCED 1000'S Cu. Ft.
	1000'S CU. FT.	% SOLIDS	% VOL. MAT.	1000'S CU. FT.	% SOLIDS	% VOL. MAT	
JAN.	35.63	5.78	3.93	29.10	3.93	2.16	512.81
FEB.	31.09	6.22	4.04	6.37	3.80	2.13	459.34
MAR.	29.06	6.76	4.33	34.83	4.22	2.45	1587.20
APR.	29.93	8.30	4.98	4.68	6.60	3.10	784.34
MAY	30.20	8.02	5.05	34.21	6.15	3.97	614.17
JUNE	30.28	6.34	4.25	45.74	5.30	2.65	602.48
JULY	30.89	5.92	3.97	32.32	4.32	2.64	*420.71
AUG.	23.66	5.84	3.80	21.92	4.10	2.17	*283.25
SEPT.	37.01	5.96	4.05	36.67	4.18	2.63	528.49
OCT.	38.93	5.93	4.09	37.52	4.42	2.65	662.73
NOV.	35.49	6.12	4.16	25.32	4.22	2.53	564.35
DEC.	37.53	6.28	4.33	37.80	4.50	2.70	618.94
TOTAL	389.70	-	-	346.48	-	-	7638.81
AVG.	32.48	6.46	4.25	28.87	4.64	2.65	636.57

*Meter failure July 25 - August 3.

COMMENTS

Sludge volume reduction of approximately 11% indicates the fact that supernatant removal is not satisfactory, in fact this plant has never produced a satisfactory supernatant due to a lack of digester piping.

The outdoor sludge lagoon was not used in 1965 and gas production increased by approximately 39% over 1964. The volatile matter reduction was 38%.

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CONCLUSIONS

The data given in this report serve as a useful reference for all who are concerned with the operation of the Stratford Water Pollution Control Plant. This data will be especially valuable when the plant requires expansion in the future.

During the year, the plant has produced an excellent effluent having average values of BOD and suspended solids concentrations well below the commission objectives of 15 ppm.

RECOMMENDATIONS

The data shown on the flow chart indicate a high degree of storm water is entering the plant. It is recommended that, in order to postpone as long as possible a costly plant expansion (present flows are 78% of design flow), the city attempt to eliminate as much storm water as possible from the sanitary sewer system.

ONTARIO WATER RESOURCES COMMISSION